PSEUDOMYS VANDYCKI, A TERTIARY MURID FROM AUSTRALIA

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Godthelp, H. 1989 3 31: *Pseudomys vandycki*, A Tertiary Murid from Australia. *Mem. Qd Mus.* **28**(1): 171–173. Brisbane. ISSN 0079-8835.

Pseudomys vandycki sp. nov. is described from the Tertiary Chinchilla Sand, Chinchilla, and is the first Tertiary murid described from Australia. *Pseudomys vandycki* differs from all other murids in the morphology of T1 on M^1 which is large rectangular and swept back to lie almost perpendicular to the T2,3 complex. *P. vandycki* most closely resembles the extant species *Pseudomys albocinereus* in aspects of dental morphology. The position of *P. vandycki* in the genus *Pseudomys* is considered tentative pending a resolution of the paraphyly within *Pseudomys*. The arrival date of murids into Australia is discussed and a date of approximately 7mya is proposed.

☐ *Muridae, Pseudomys vandycki, Pliocene, Chinchilla, Queensland.*

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The fossil record of Australian murids is very poor. Curiently, an isolated incisor from he middle Pliocene Allingham Formation and a few isolated teeth from the middle to late Pliocene Chinchilla Sands (Archer, 1978; Hand, 1984) are all that are recorded in the literature. The Chinchilla specimens are referred to as pseudomyine (Mahoney, pers. com., in Archer, 1978). Collections made in 1983 from Pliocene conglomerates at the Chinchilla Rifle Range have provided additional murid specimens and enabled the description of a new and distinctive rodent, *Pseudomys vandycki.*

All measurements are metric. The dental terminology follows Missone (1968). The author has examined actual specimens, casts or photographs of all known species of Australian modern and fossil murids. Where actual specimens or casts were not available photographs were used in conjunction with published descriptions.

SYSTEMATICS

HOLOTYPE

Queensland Museum F16834, a right maxillary fragment with M^1 and M^2, collected in 1983 by Godthelp, Archer, Gillespie and Blandford. Figure 1.

TYPE LOCALITY

Main Gully System, Chinchilla Sand, Chinchilla Rifle Range, Chinchilla, southeastern Queensland.

ETYMOLOGY

Named in honour of Stephen Van Dyck, Curatorial Officer (Mammals) at the Queensland Museum, who has had a long term involvement in advancing the phylogenetic systematics of Australian mammals.

DIAGNOSIS

Pseudomys vandycki is a medium-sized rodent that differs from all outer murids in that the T1 of M^2 is large and has a rectangular occlusal surface, which is swept back so as to be aligned almost perpendicular to the T2,3 complex. It is most similar in aspects of dental morphology to *Pseudomys albocinereus* but differs in the relative size of T1 to the other cusps and the degree to which this cusp is swept back. The molars of *Pseudomys vandycki* are also larger and more elongate than those of *Pseudomys albocinereus.*

DESCRIPTION

Maxilla: Very little of the maxilla is preserved. The holotype does retain the posterior buccal edge of the incisive foramen, which ends slightly posterior to T1 on M^2.

The molars (Table 1) are three rooted, elongate, cuspidate and brachydont. The edge of T1 is positioned in front of the posterior edge of T2 and the anterior edge is positioned slightly anterior to the anterior edge of T5. The T2 is large and semicircular. Its posterior edge is concave and there is some thickening of the enamel at the apex of the anterior edge. The T3 is absent or incorporated into

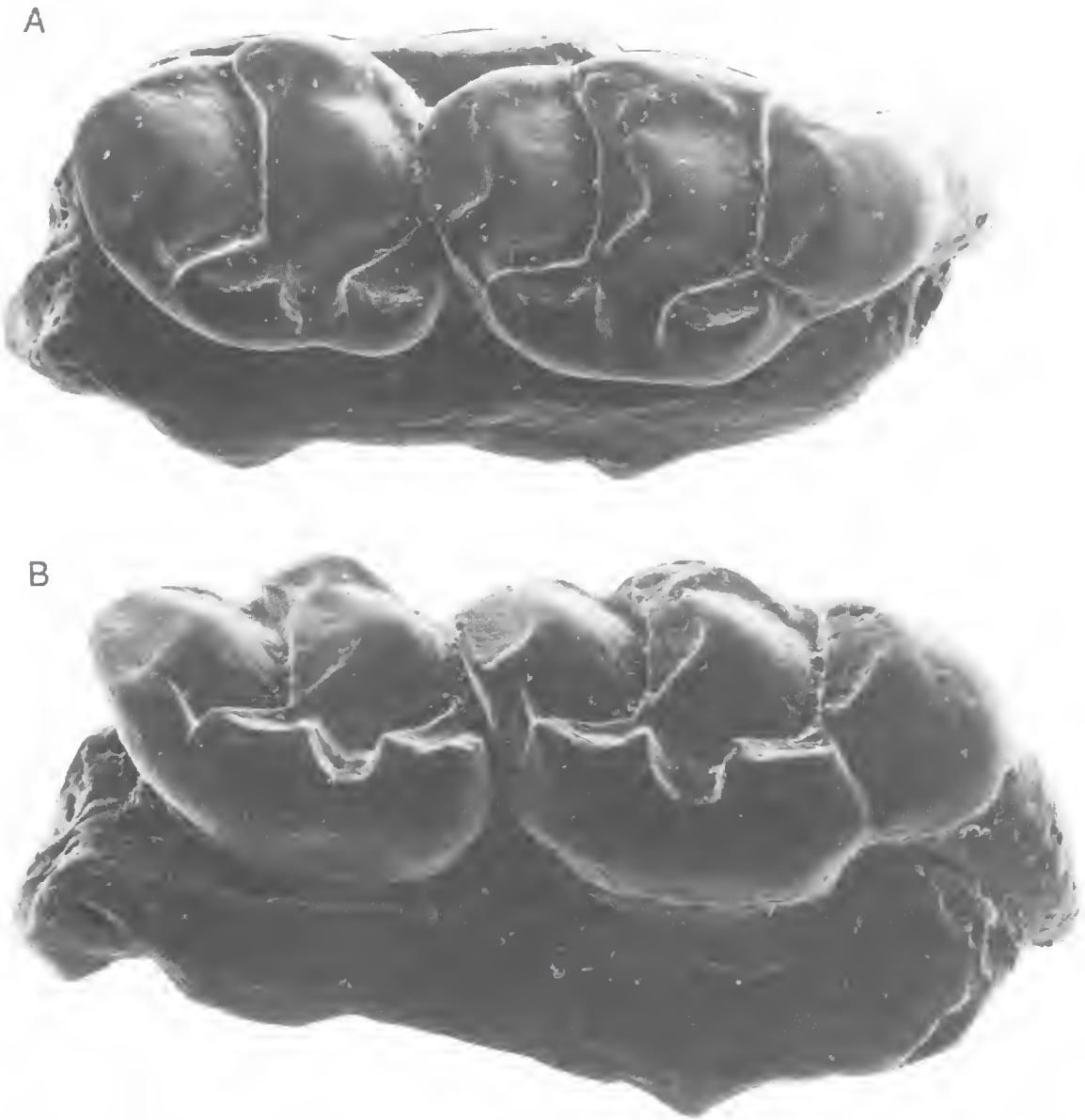

FIG. 1. A, Occlusal view of holotype (QMF 16834) of *Pseudomys vandycki*. B, Oblique occlusal view from a lingual aspect.

a T2,3 complex. The T4 is moderately large and isolated from T5. The T4 is almost perpendicular to T4,6 complex. The occlusal surface of T4 is nearly rectangular, tapering slightly in the posterior quarter. The anterior edge is level with the posterior edge of T5 and the posterior edge is level with the anterior edge of T8. The semicircular T5, although smaller than T2, is large. Its posterior edge is concave and there is some enamel thickening on the apex of the anterior edge. T6 is the smallest cusp present. The occlusal surface is triangular in shape and connected to T5 at an early stage of wear. The T7 is absent. The T8 is large and elliptical with a convex posterior edge. The T9 is absent or incorporated into the T8 complex.

M^2: The T1 is isolated and triangular in occlusal view. The T2 and T3 are absent. The T4 is equal in size to T1. It is positioned almost perpendicular to the T5,6 complex to which it is joined by a narrow wear facet. The T5 is large and triangular with a

M^1 length	2.71 mm
M^1 width	1.41 mm
M^2 length	1.93 mm
M^2 width	1.44 mm

TABLE 1: Measurements. (All measurements represent maximums)

concave posterior edge. The T6 is smaller than T5 to which it is joined. The T7 is absent. The T8 is large and elliptical and there is some enamel thickening along its anterior edge. The T9 is absent or incorporated into the T8 complex.

DISCUSSION

Pseudomys vandycki is only tentatively referred to the genus *Pseudomys*. This referral is based on its overall similarities to other species currently placed in the genus (Tate, 1947; Watts and Aslin, 1981) and in particular to *Pseudomys albocinereus*. *Pseudomys vandycki* shares features with some species of the genus *Pseudomys* which can be considered diagnostic at the generic level: three rooted M^1; relatively elongate molars; poorly developed buccal series of cusps; absence of T7; and lack of buccal displacement of the T5,6 complex.

The genus *Pseudomys* is generally accepted to be paraphyletic (Watts and Aslin, 1981). It contains many essentially plesiomorphic species that share few synapomorphies with other species in the genus. Morphological evidence (Lidicker and Brylski, 1987) from extant species and evidence from other, as yet undescribed, Tertiary murids from the Riversleigh deposits in northwestern Queensland (Godthelp in prep.) suggest that *Pseudomys* is polyphyletic. This concept, in so far as it can be checked for living species referred to the genus, is supported by genetic data (Baverstock *et al.*, 1981). Thus it is possible, pending a thorough revision of the genus, that *P. vandycki* may fall outside *Pseudomys sensu strictu*.

There is a particularly close resemblance between this species and *P. albocinereus*. Both species have isolated T1 and T4 which are positioned postero-lingual to the first and second cusp complexes. If this reflects monophyly, it suggests that *P. vandycki* and *P. albocinereus* form a distinct species group within *Pseudomys*.

Recent estimates of the time of entry of murids into Australia have been placed at 4.5 My (Archer, 1978, based on the oldest record then known) and 5-7 My ago (Watts and Aslin, 1981). The high diversity of murids, approximately 15 species, recently collected from the middle to late Pliocene of Queensland (Godthelp, 1987) suggests a entry time predating the middle Pliocene, possibly as early as 7 My ago.

It has also been assumed that murids came into Australia via rainforest corridors and only subsequently spread into the more arid environments. However the only rodents that are found in Australian rainforests today are those that appear to have entered Australia from New Guinea during the Pleistocene — *Melomys, Uromys, Pogonomys* and *Rattus* (Simpson, 1961; Taylor and Horner, 1973; Watts, 1981). It seems at least as probable that the murids entered Australia via xeric corridors which still persist in the northwest of the continent.

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